IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Application of:

Hideki USUKI et al. Group Art Unit: 1774

Serial No.: 09/684,927 Examiner: Ling X. Xu

Filed: October 10, 2000

For: PROTECTIVE LAYER TRANSFER SHEET

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Assistant Commissioner for Patents

Washington, D. C. 20231

SIR:

DECLARATION UNDER 37 CFR 1.132

I, Kenichi HIROTA, the undersigned, a citizen of Japan and a resident of 1-1, Ichigaya-Kaga-Cho, 1-Chome, Shinjuku-Ku, Tokyo, Japan, do hereby declare as follows.

1. I am a researcher of thermal transfer printing technology including the subject matter claimed in the above-identified patent application entitled "PROTECTIVE LAYER TRANSFER SHEET" which was given United States Serial No. 09/684,927, and accordingly I am fully familiar with the contents of the patent application.

2. I graduated from Osaka City University, the Faculty of Engineering, the Department of Applied Chemistry in March 1997, and finished the Master's Course of the graduate school of

Engineering, Osaka City University in March 1999. Since April 1999, I have been employed by Dai Nippon Printing Co., Ltd., and I have been engaged in research and development of thermal transfer printing technology.

3. I have read and am familiar with the contents of the application in caption and am also familiar with the references cited by the U.S. Patent and Trademark Office Examiner in the Official Action. In view of the Examiner's position shown in the Official Action, I have under my direction and control conducted experiments, the particulars of which are given hereinbelow.

4. In order to establish the patentability of the present invention, I would like to show the criticality of the claimed content range of microsilica in the adhesive layer of the protective layer transfer sheet according to the present invention. The particulars of our experiments are as follows.

5. The production process according to Example 1 of the present specification was repeated except that the content range of microsilica ("Silysia 310" manufactured by Fuji Silysia Chemical Ltd.) in the adhesive layer was varied from 3% by weight to 20% by weight, more specifically, 3%, 12% and 20% by weight. Slip property and transparency of the protective layers obtained were evaluated as follows.

Evaluation of slip property

The protective layer transfer sheets prepared and an imag - receiving paper "P60NOC" for a printer "P-330", manufactured by Olympus Optical Co., Ltd., on which a protective layer is to be transferred, were provided. The coefficient of friction between the surface of the protective layer transfer sheet (i.e., the surface of the adhesive layer) and the surface of the image-receiving sheet was measured in terms of the coefficient of static friction μ_0 and the coefficient of dynamic friction μ. The results of measurements are as follows.

TABLE 1

Silica content	μ_0	μ	μ_0/μ
3%	0.37	0.25	1.45
12%	0.37	0.28	1.34
20%	0.31	0.27	1.15

The above results show that 3% to 20% by weight of the content range of microsilica in the adhesive layer of the protective layer transfer sheet satisfies the slip properties as defined in claim 1.

Evaluation of transparency of protective layer

Printing was carried out using a full-color test pattern to obtain a print. A protective layer was then transferred from each protective layer transfer sheet onto the surface of the print. The OD (optical density) valu of each print at places of fifteen steps in gradation from the highlight portion to the shadow portion in color mixed portions of y llow, magenta and cyan was measured with RD-918 manufactured by Machbeth. An

evaluation was conducted for a lowering in transparency (lowering in print density) as compared with the case where silica was not added (i.e., 0%). The results of measurements are as follows.

TABLE 2

STEP	0%	3%	12%	20%
15	1.95	1.96 (+0.01)	1.91 (-0.04)	1.84 (-0.11)
14	1.66	1.69 (+0.03)	1.65 (-0.01)	1.6 (-0.06)
13	1.36	1.36 (0)	1.34 (-0.02)	1.33 (-0.03)
12	1.11	1.11 (0)	1.11 (0)	1.1 (-0.01)
11	0.92	0.92 (0)	0.92 (0)	0.92 (0)
10	0.76	0.76 (0)	0.77 (+0.01)	0.76 (0)
9	0.61	0.61 (0)	0.63 (+0.02)	0.63 (+0.02)
8	0.48	0.47 (-0.01)	0.5 (+0.02)	0.49 (+0.01)
7	0.38	0.37 (-0.01)	0.4 (+0.02)	0.39 (+0.01)
6	0.28	0.27 (-0.01)	0.3 (+0.02)	0.3 (+0.02)
5	0.21	0.2 (-0.01)	0.23 (+0.02)	0.22 (+0.01)
4	0.15	0.15 (0)	0.17 (+0.02)	0.17 (+0.02)
3	0.1	0.09 (-0.01)	0.11 (+0.01)	0.11 (+0.01)
2	0.07	0.06 (-0.01)	0.07 (0)	0.07 (0)
1	0.05	0.05 (0)	0.06 (+0.01)	0.05 (0)

The results above show that the OD value unexpectedly reduces at the level of STEP 15 in the range of 12% or more of the microsilica content. STEP 15 means that gradation of the printed image is at the darkest level. Thus, the deterioration

of transparency of the printed image critically app ars at the level of STEP 15.

6. The above results show that the claimed range of the microsilica content as well as the claimed relationship between the coefficient of static friction μ_0 and the coefficient of dynamic friction μ are critically important to obtain a protective layer transfer sheet being excellent both in (i) improvement of carrying property in a thermal printer and (ii) transparency of the protective layer which covers the surface of the printed image.

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

September 5, 2003

Declarant:

Kenichi HIROTA